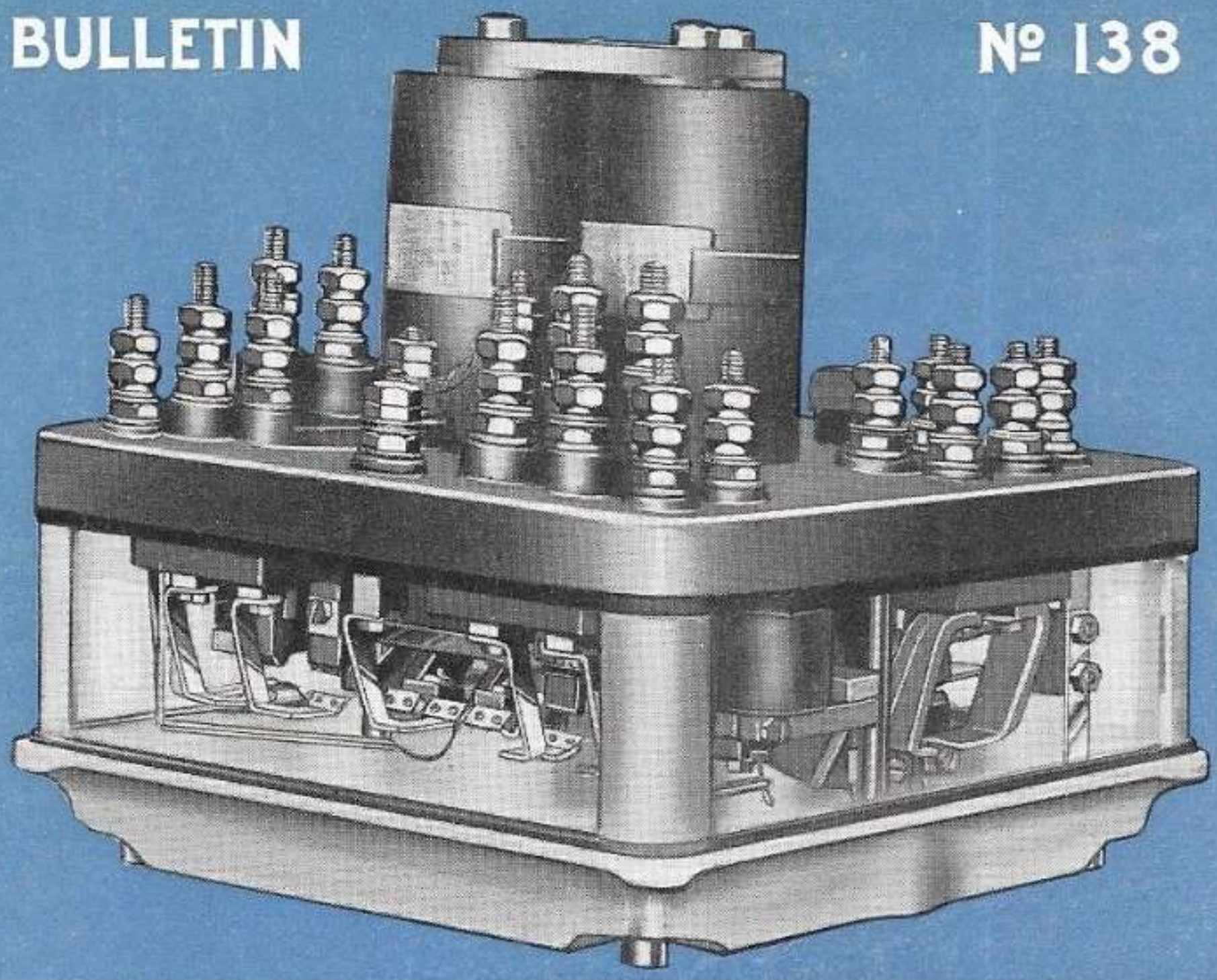
BULLETIN

№ 138

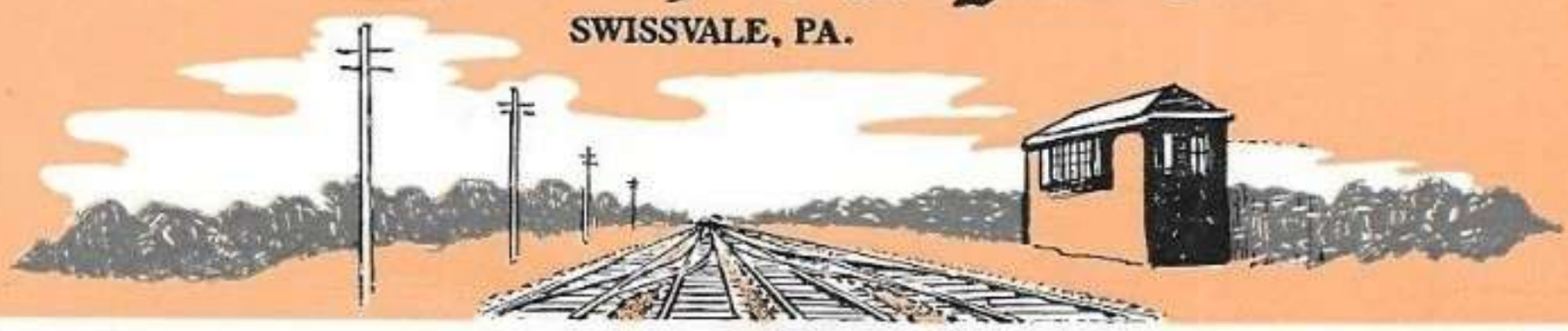


Union

DT-10 TIME ELEMENT

Relay

Union Switch & Signal Co.
SWISSVALE, PA.



DT-10 Time Element Relay

THE Union Switch & Signal Company announces the development of a new D. C. Time Element Relay, called the DT-10. This relay is designed to provide an automatic release for route locking; for use in dispatcher control installations; or in other circuits requiring a relay of this character.

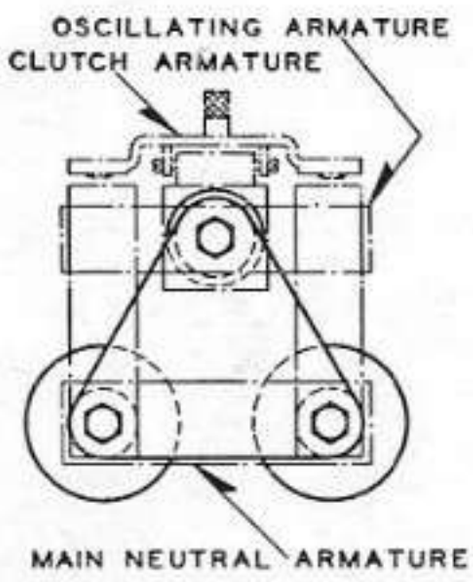
New Features

There are several important features offered in the new "Union" DT-10 Time Element Relay. One of the most important of its features is its method of operation, which is economical and absolutely certain. The pick-up of the neutral armature does not occur until the time element is completed, and the time element of this relay cannot be defeated by changing the external connections. On this relay, also, is a check contact which closes after each de-energization of the relay, and which should be used in an external circuit to indicate that the time element device is in its normal position ready for the next operation. Another important item is the simplified construction which results in a compact arrangement that saves space in the instrument shelter.

Operation of Relay

The new "Union" DT-10 Time Element Relay has only one set of two main magnets and two small auxiliary or neutralizing coils. The time interval is obtained by the motion of an oscillating armature, which is converted to a rotary motion by means of a ratchet wheel and pawl driving a set of planetary gears. When the control circuit is closed, the main operating coils are energized over a circuit that includes the back contacts of the neutral armature. The flux through the neutral armature is in such a direction as to hold this armature down; part of the flux is diverted to operate the oscillating armature; and a small portion operates a clutch armature which causes a clutch to engage the stationary gear of the planetary system. The operation of the oscillating armature causes the planetary system to rotate step by step about the stationary gear until it closes a contact at the end of the time interval. The closing of this contact energizes the neutralizing coils and permits the neutral armature to pick up. When pick-up of the neutral armature occurs, its back contacts are opened, stopping the action of the oscillating armature and opening the low resistance operating circuit. The neutral armature is then held

up by high resistance holding coils in series with one operating coil and the neutralizing coils, and remains picked up as long as the control circuit is closed. The neutral armature cannot pick up before the time interval has been completed because the operating circuit is made over its back contacts. If these contacts open, the relay is at once de-energized.



TOP VIEW SHOWING ARRANGEMENT OF COILS

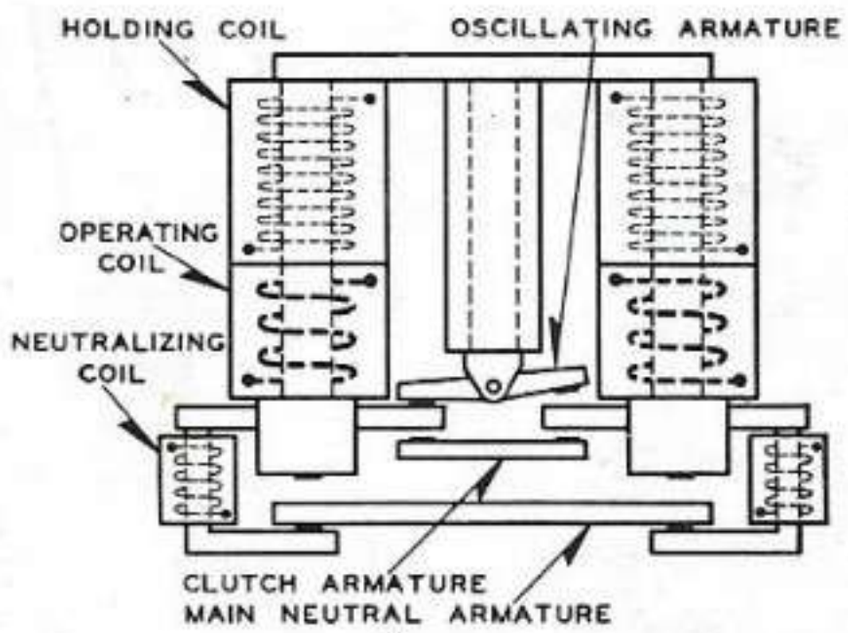
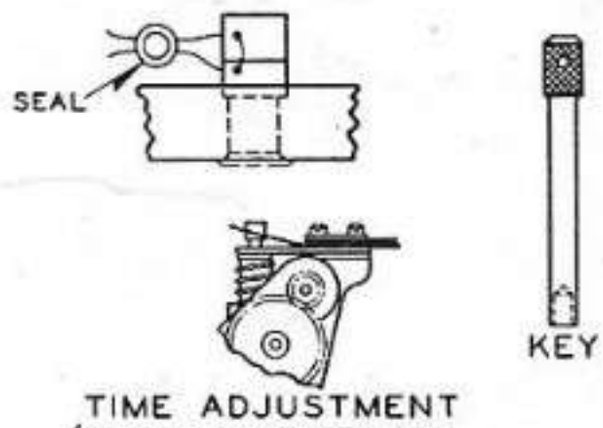


DIAGRAM SHOWING MAGNETIC CIRCUITS



TIME ADJUSTMENT
(OPERATED BY KEY AND NORMALLY SEALED AND LOCKED.)

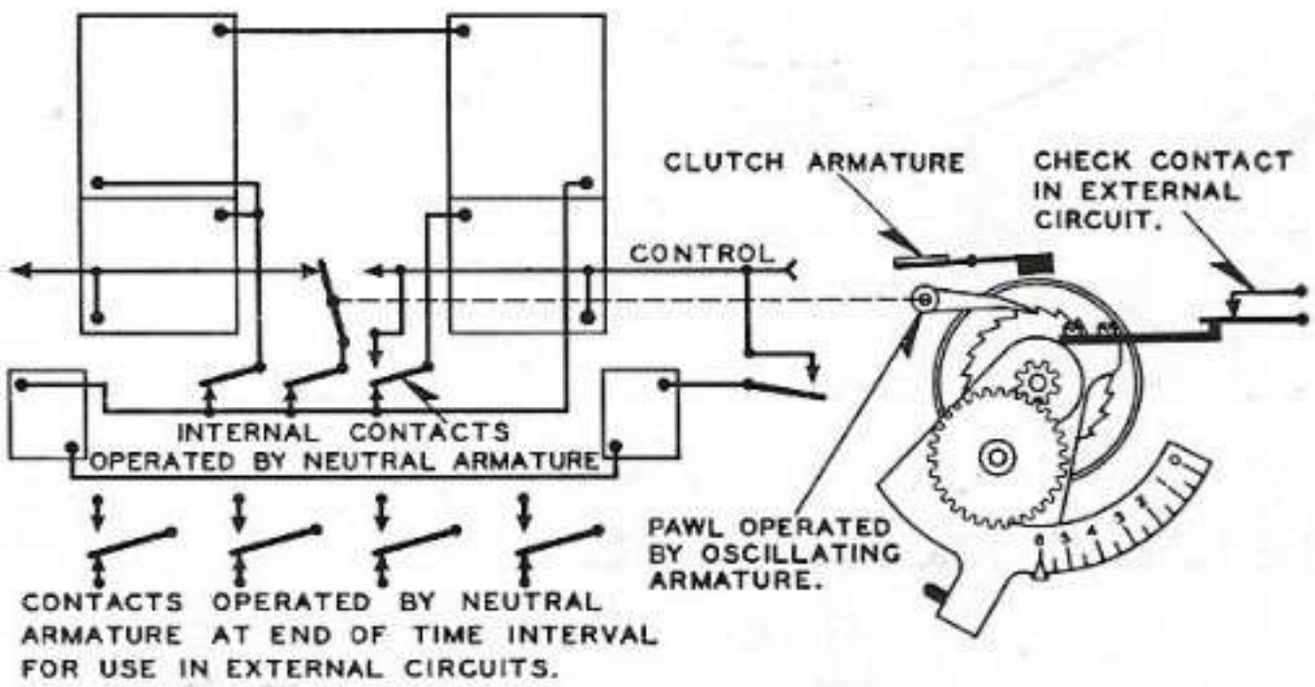

CLUTCH ARMATURE
CHECK CONTACT IN EXTERNAL CIRCUIT.
CONTROL
INTERNAL CONTACTS OPERATED BY NEUTRAL ARMATURE
PAWL OPERATED BY OSCILLATING ARMATURE.
CONTACTS OPERATED BY NEUTRAL ARMATURE AT END OF TIME INTERVAL FOR USE IN EXTERNAL CIRCUITS.

DIAGRAM SHOWING INTERNAL WIRING AND TIME ELEMENT FEATURE.

The planetary gear is so arranged that when energy is taken off the relay the clutch holding the stationary gear releases it and allows the gear train to drop to the normal position. The check contact is closed by this means and may be used to indicate that the relay is in proper condition for the next operation.

Excellent Characteristics

This relay may be furnished with either of two ranges of time adjustment, the first range being from 10 to 120 seconds and the second being from ½ to 6 minutes. This is accomplished by providing a different gear ratio in the planetary system. The time element is adjustable anywhere within these ranges. In the 120 second relay, the check contact opens in from 3 to 5 seconds after the relay is energized; in the 6 minute relay, this opening time of the check contact varies between 10 to 15 seconds. The adjustment, which can be locked and sealed, is accomplished by a special key which is introduced through the top plate.

The relay may be furnished for operation at any standard voltage and has excellent time interval regulation for given voltage variations. The standard time element relay is designed to have sufficient retardation in release so that it may be employed in a circuit in which the time element relay is energized over the back contact of a standard relay, which, in turn, is picked up by the time element relay at the end of the time interval.

Flasher contacts can be added to the six minute relay and the relay made to operate as a flasher relay under certain conditions. This is of great advantage in highway crossing installations using direct current circuits and involving a time element. A good example of a case where this relay would be advantageous is an installation where a great amount of switching occurs over a crossing. In such a case, the new "Union" DT-10 Time Element Relay may be used both as a time element and a flasher relay.

Standard Construction Features

The new "Union" DT-10 Time Element Relay has the improved terminal post arrangement that is characteristic of all "Union" DN Type Relays; the terminal posts are arranged in rows at different levels and parallel to the base. This terraced arrangement of binding posts facilitates making connections to the relay and the tracing of circuits in the instrument shelter. The top plate is moulded bakelite and the base structure has a metal bottom and plate glass sides. The terminals are lettered for easy identification. The base structure on all models is equipped with lugs which support the relay for shelf mounting and also provide a means for furnishing shock absorbing springs. The standard mounting is the shelf type but a bracket may be attached to the top plate for wall mounting.

Ordering References

Plates E-5200, E-5240 and E-5250 of our Catalogue give the ordering references for Union DT-10 Time Element Relay.

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